

Exhibit 1, part 1: see notes on this exhibit that explain relevance of this exhibit to the reply's text.

TO: Darrell Maxey, Dan Guerrero
FROM: PTC Technical Team
DATE: September 26, 2009
SUBJECT: RF Spectrum for PTC

Issue

Radio frequency (RF) spectrum is required in order to operate Positive Train Control (PTC) on Metrolink trains.

Preferred Solution

Purchase 1 MHz of spectrum in the AMTS band around 220 MHz from Spectrum Bridge, for a not-to-exceed amount of \$7,500,000.

Alternative Solutions

Alternate sources of RF spectrum exist but investigation to date has not located any that are comparable to the preferred solution. Nonetheless, parallel or backup solutions need to be pursued in case the preferred solution does not materialize. Therefore, alternative solutions are addressed in this memo as well.

Background

Federal legislation (RSIA'08) requires implementation of PTC by 2015 on passenger railroads. The state of California has a more aggressive target of 2012. PTC systems require a substantial amount of dedicated RF spectrum in order to operate. Metrolink's PTC system will be required to interoperate with that of UP and BNSF, both of which will use 220 MHz radios designed to comply with a railroad-specific interoperable protocol and air interface to be defined by the freight railroads Interoperable Train Control (ITC) committee. Suitable available spectrum at 220 MHz is extremely limited. An opportunity exists to obtain enough suitable spectrum at 220 MHz for Metrolink's PTC system, but this opportunity could cease at any time given that another organization is actively pursuing the same.

Advantages of purchasing the current spectrum offering are:

1. It permits interoperability with the UP and BNSF PTC systems, since they will also use 220 MHz data radios. Federal legislation (RSIA'08) requires that PTC systems be interoperable.
2. It eliminates the risk of not being able to obtain sufficient 220 MHz spectrum to meet Metrolink's PTC needs. This risk is high if this block of spectrum is not obtained since no other sizeable block of 220 MHz spectrum is known to be definitely available in the Los Angeles area.

These documents, obtained from SCRRRA under a California Public Records Act Request, show that SCRRRA could have pursued other spectrum options besides AMTS and that the entire 1 MHz of MCLM's AMTS is not needed and that SCRRRA wants to use it in negotiations with freight railroads, for other SCRRRA purposes other than PTC, or possibly lease or resell some of it. TO DATE, SCRRRA HAS NOT SHOWN THE FCC HOW MUCH SPECTRUM IT ACTUALLY NEEDS FOR PTC. See highlights, arrows and text boxes below calling out some relevant sections. Thus, SCRRRA is misrepresenting to the FCC that its only option is AMTS and that it needs the entire 1 MHz for PTC.

Alternative sources of radio spectrum exist. (It would appear that MCLM's price was just too good to pass up.)

No suggestion that AMTS or 200MHz was mandated by Congress for PTC

Entire 1 MHz not needed. It can be used for other purposes, or "used in negotiation with the Class I freight railroads", or resold.

3. If the entire 1 MHz block is purchased, it will likely exceed the needs of PTC. While there are still many unresolved issues that could significantly affect the amount of spectrum required, **the current estimate is that Metrolink will need 400 kHz of interference-free spectrum between 217-222 MHz to support 16 bi-directional TDMA 25 kHz channels for PTC.** The additional spectrum can be used for other Metrolink purposes such as emergency communications. Or it can be leased or resold (provided it is absolutely certain it will not be needed for PTC) or it can be used in negotiations with the Class I freight railroads. Any excess spectrum should not be resold, however, until absolutely certain it will not be needed for PTC, including potential future expansions of the PTC system. The current owner leases the spectrum to a local 2-way radio service provider on a monthly basis. This sort of arrangement can likely be maintained to keep the spectrum in use and provide supplemental income to Metrolink until the spectrum is actually needed for PTC use. See attachment <MC_LM Lease Spectrum Mgr.pdf>.

In that this recommendation results in a non-competitive negotiated procurement, the **justification for the sole source** is as follows:

1. No other sizeable block of 220 MHz spectrum is known to be definitely available or likely to become available in the Los Angeles area in the necessary timeframe.
2. Interoperability with UP and BNSF (who will use 220 MHz) is required per federal legislation (RSIA'08).

The cost proposal submitted by MC/LM for the proposed spectrum (0.35 per MHz-pop) appears to be fair and reasonable. However, **we request verification of that from the spectrum attorney.**

Open Issues

Warren Havens has filed the attached petition <MC_LM PetitionReconsider.pdf> against MC/LM (MC/LM's response <MC_LM Response.pdf> is also attached). The effect of this could range from preventing MC/LM from selling the spectrum to delaying the sale to no effect at all. Even if Havens does prevail, it is quite possible that the FCC would only fine MC/LM, not revoke their license to the spectrum. FCC hopes to get it resolved by the end of this year, but said it very well might not happen by then. In any event, wording should be added to the contract making it clear that Metrolink's deposit is to be refunded in full if MC/LM's license is revoked.

Maritime users might still have primary access to the AMTS band. This would be unacceptable for PTC use, so it must be resolved.

BNSF's version of PTC may require two data radios on board simultaneously operating on two different channels. If this comes to pass, then dual coverage (on different channels or possibly different bands) may be required on board Metrolink trains.

SCRRRA was fully aware of SkyTel entities petitions and risks associated with it and that FCC might take it back, but still chose to proceed with a contract with a license revocation being possible. If PTC is so urgent, then it should not have pursued spectrum subject to possible revocation.

The Metrolink required coverage area needs to be clearly agreed upon, including any provisions for future expansion, if applicable.

Verification needs to be made that no channel 13 TV users exist in the area. If they do exist, potential interference (in both directions) must be analyzed.

Border/fringe coverage areas need to be analyzed to ensure that the proposed spectrum purchase will reach all required areas without interfering with neighboring incumbents or vice versa.

The draft agreement for purchase of MC/LM spectrum <Metrolink.APA.9.10.09.doc> needs to be **thoroughly reviewed by the spectrum attorney and needs additional caveats** to address issues (Havens, maritime use, etc.) in this paper.

There were other 200 MHz spectrum options available.

Alternative Spectrum Solutions at 220 MHz

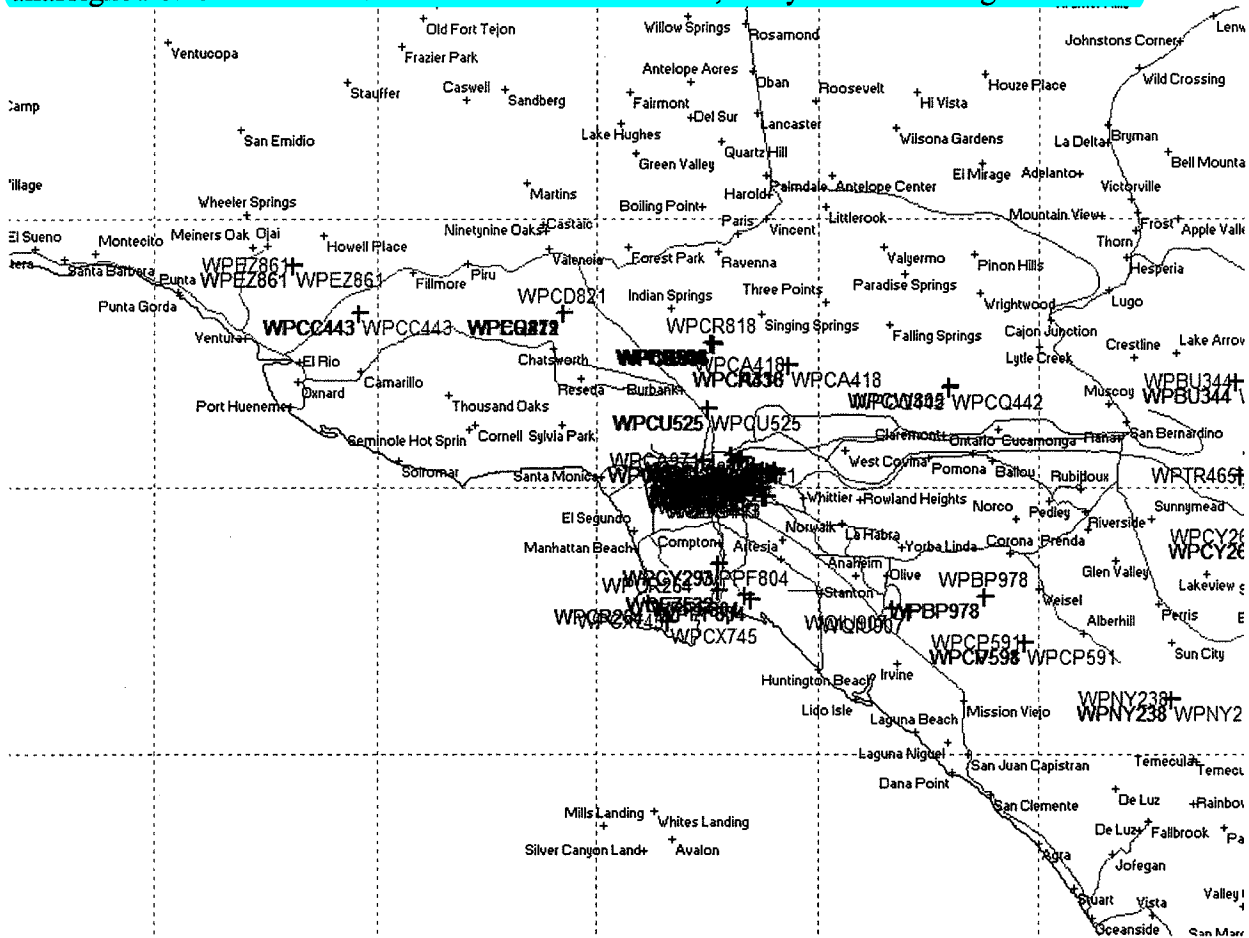
TTCI ran an interference analysis in the LA area on the 5 kHz channels between 220-222 MHz. We found a number of channels that show no interference at all and with enough contiguous clear channels to be aggregated into the necessary number of 25 kHz channels to support PTC. If these are currently unlicensed, then the FCC's normal means to make them available (to anybody other than public safety* users) is via auction. To make them available specifically for PTC and bypass the auction process would require a waiver or a change in rulemaking. Given the importance of PTC, the FCC may well be "sympathetic" toward the granting of such a waiver or change in rules, but there is no guarantee FCC would grant it and in the mean time, somebody else might purchase the spectrum that is currently known to be available. **This may be a good area for the spectrum attorney to investigate.** * One of the FCC contacts said that a commuter agency would not likely qualify for the "public safety" category.

The 1 MHz block of spectrum from 218-219 MHz formerly known as IVDS (Interactive Video Distribution Service) is largely idle at this time. The IVDS experiment failed and nobody else has developed significant applications for it since. This spectrum has been renamed "218-219 MHz Service". There are a lot of restrictions that apply to this band as the result of TV broadcasters wanting to protect the nearby channel 13 from interference (much of the US has no channel 13 coverage, however, and therefore this is not a concern in those places). These restrictions can be found in the 47CFR95.801 - .861.

For FCC to do a rulemaking change (e.g., regarding the 220-222 MHz or 218-219 MHz spectrum discussed above) the first thing that must happen is for somebody (e.g., industry) to request it of FCC. The person with whom I talked at FCC was not aware of anybody having made a formal request to FCC to date for designating/making available a PTC band at 220 MHz.

The figure below shows locations of current 217-222 MHz licenses in the Los Angeles area. The center of Los Angeles is by far the most congested area. Frequencies in use away from that congested area can probably be reused so there most likely won't be a

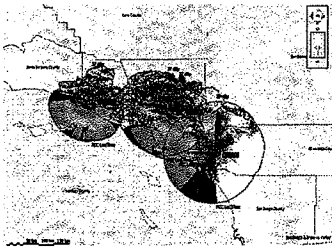
For the frequencies 220 - 222 MHz, TTCI searched the FCC ULS database and copied the frequencies and powers (when given) into attached spreadsheet <Metrolink_220_Freqs.xls>. On Sheet 2 of the spreadsheet, they have been sorted and gaps between the licensed frequencies have been identified. Frequencies not already assigned were designated with an "X" next to them. There appear to be a total of 262 unassigned 6.25 kHz channels for a total of 1.320 MHz, many of them contiguous.



There are private owners of significant chunks of "220 MHz" spectrum in the LA area. For example, Paging Systems, Inc., (Susan Cooper) owns the licenses below. These comprise one of the AMTS B-blocks. She currently uses it for her paging systems service, but it might be worth contacting her to see if she'd consider selling the spectrum. There are other similar private owners of spectrum in the Los Angeles area not currently advertising for sale but who might sell for the right price.

<u>Call Sign</u>	<u>Lat</u>	<u>Lon</u>	<u>Frequency Range</u>	<u>ERP</u>	<u>Ant Ht.</u>
KEB295,	33-42-39.1 N,	117-32-04.2 W,	217.0125-217.4875,	50.000,	21.0m
WHG660,	34-16-09.0 N,	118-14-01.3 W,	217.0125-217.4875,	50.000,	15.0m
WHU327,	34-20-55.0 N,	119-20-00.4 W,	217.0125-217.4875,	50.000,	51.0m
WHX782,	34-13-33.0 N,	118-04-00.2 W,	217.0125-217.4875,	50.000,	28.0m

Using that data, we plotted their coverage area in LA.



Purchase of MCLM AMTS was only one option, if "issues" could be removed. It was fully aware of SkyTel entities' challenges

BOTTOM LINE: Alternative sources of 220 MHz spectrum might become available as described above. However, they might not become available and we may not know for sure anytime soon. So, the one clear way to be nearly sure Metrolink will have the spectrum needed for PTC would be to purchase AMTS A-block spectrum from MC/LM

(if the issues cited can be successfully resolved). We will continue to seek additional information on the various potential sources of spectrum for PTC.

PTC-220 LLC might have spectrum available that Metrolink can use, although it's not certain at this time that PTC-220 LLC will even have enough spectrum for their own use. More information can be found on PTC-220 LLC in Appendix 1 regarding Technical Issues.

Channels 161-170; Sub-Band B of 220 MHz Band (Total 100 KHz set aside for Public Safety service use for which SCRRA may qualify) may be considered (see later comments).

Alternative Spectrum Solutions outside of 217-222 MHz

Any spectrum outside of 217-222 MHz would be considered a last resort only, since it would require all UP and BNSF locomotives that operate on Metrolink to be dual-equipped (220 MHz and the other band radios) which would meet with significant resistance from UP and BNSF. Likewise, all Metrolink trains that operate on UP or BNSF would need to be dual-equipped. Any non-standard application requiring different equipment on tenant trains such as UPRR, BNSF and Amtrak will most assuredly raise questions as to which party should absorb the additional cost. This would very likely evolve into a trackage rights issue.

With that said, other options would include:

900 MHz

- ATCS 6 channel pairs – only 1 likely available to Metrolink, and that's already used for code line
- Others channels at 935-941 MHz and 896-902 MHz.
- Note that there is insufficient capacity for PTC using the ATCS Spec-200 protocol.
- Note that there is reduced propagation at UHF as compared with VHF.

160 MHz

- Higher Performance Data Radio (HPDR)
- Would required several licenses from AAR.

Other bands

- 150 MHz
- 700 MHz (reduced propagation)
- other

Attachments

- <MC_LM PetitionReconsider.pdf> Warren Haven's petition
- <MC_LM Response.pdf> MC/LM response to Warren Haven's petition

PTC-220 LLC may have spectrum. SCRRA and PTC-220 LLC have not shown that PTC-220's spectrum is not enough. Also, SCRRA could have applied for public safety set-aside 220-222 channels.

There were plenty of other spectrum band options. SCRRA just preferred AMTS, it was not its only option.

SCRRA fully aware of Havens' challenges prior to entering contract.

- <Metrolink.APA.9.10.09.doc> Draft MC/LM purchase agreement from Spectrum Bridge, Inc.
- <Metrolink contour map frm SpBridge.pdf> Proposed coverage map from Spectrum Bridge, Inc.
- <MC_LM Lease Spectrum Mgr.pdf> One of MC/LM's existing leases in the Los Angeles area.
- <Site-Market Based Licenses.xls> Site-based and market-based licenses for the Los Angeles area, along with identification of unassigned spectrum
- <Metrolink_220_Freqs.xls>

Appendices

1. Technical Issues
2. Business Issues
3. Business Plan and Strategy
4. Draft MC/LM Contract

Appendix 1. Technical Issues

One of the critical engineering requirements for the implementation of PTC on the SCRRA railroad is the following:

*Reliable, accurate and up-to-date **movement authority** information must be sent from the SCRRA dispatch center or wayside signals to all locomotives (including host and tenant locomotives) travelling on SCRRA tracks in order to keep trains moving on schedule.*

The “method” by which this **movement authority** information will be sent from the SCRRA dispatch center or wayside signals to locomotives must be via a radio communication network. The Class 1 freight railroads, which require interoperable radio communications amongst all Class 1 freight as well as the passenger railroads, plan to procure data radios tunable from 217-222 MHz.

Two of the Class 1 railroads (UP and NS) have jointly formed a company called PTC-220 LLC and acquired nationwide spectrum in the 220 MHz band for this purpose. The other two large US freight railroads (CSX and BNSF) are expected to acquire spectrum and join the LLC (actually BNSF just recently did acquire spectrum). Refer to figure 1.1 below for details. The turquoise-colored blocks represent the nationwide spectrum currently owned by UP and NS under the LLC. The LLC also owns additional regional licenses in places such as Los Angeles, New York City, et al. The FCC which regulates the use of the radio spectrum has approved the use of this spectrum for the purpose identified. The white “M” block pair has just been purchased by BNSF. The other white block pair (“K”) is currently owned by NRTC (a non-railroad entity) and is not for sale. The yellow block pair is owned by AAR and is used for remote control locomotives (RCL) throughout the US. It is therefore not available for PTC use. Additional 220 MHz spectrum may yet be purchased by the freight railroads.

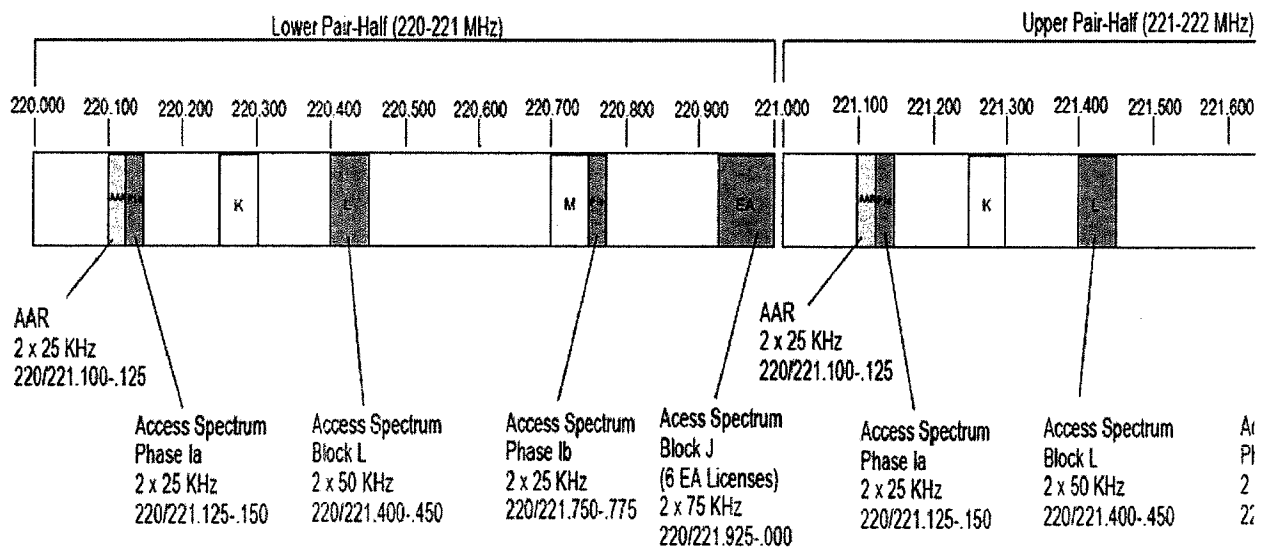
Why did SCRRA not try to purchase this? And PTC-220 LLC has said it would share with other railroads.

The SCRRA has sole responsibility for acquiring the required spectrum in the counties of Southern California (Also known as Economic Areas (EA) 160 and 161, refer to figure 1.2 for details) for use by the SCRRA in the implementation of PTC.

The complex technical specifications that shall define the architecture of the interoperable 220 MHz radio communication network are still under development by the Class 1 railroads, and critical details are still unknown. The quantity of 220 MHz spectrum required for the implementation of PTC is closely correlated to this selected architecture. Additionally, there exists a complex relationship between the quantity of spectrum required and parameters such as locomotive population, speeds, headways, future

growth and terrain. As a result, the selected PTC Vendor/Integrator shall be required to perform the analysis and coordination required to determine the appropriate amount of 220 MHz spectrum required to meet present and future PTC requirements of the SCRRA. Given the critical importance of this 220 MHz spectrum, it is recommended that the SCRRA mitigate the risks by taking a more conservative approach for the acquisition of said spectrum. The risks associated with acquiring too little spectrum will have profound negative long term consequences to SCRRA operating parameters such as locomotive population, speeds, headways and future growth.

FIGURE 1.1 PROPOSED 220 MHz PTC SPECTRUM PLAN



The license for the 220 MHz spectrum shown in figure 1.1 was initially acquired by private owners via the FCC auction process. These private owners are permitted under FCC regulations to re-sell or transfer their licenses to other private parties such as the SCRRA. The initial license for the 220 MHz spectrum shown in figure 1.1 was also acquired for a contiguous geographic area or areas, known as Economic Area(s) EA defined per the EA map shown in figures 1.2a and 1.2b. Although the initial 220 MHz license acquired via the FCC auction was acquired for one or more contiguous EAs, there are no known FCC regulations that would prohibit subsequent license transactions, such as transfers or re-sales from occurring according to said EA boundaries. This means that, although unlikely, it is possible that portions of the 220 MHz spectrum offered by the current seller may not be contiguous over the entire EA(s).

Additionally, FCC rules require that incumbents (defined as licensees of small portions of adjacent or overlapping 220 MHz spectrum, prior to the subject FCC auction) shall be protected. Protection is defined as any combination of mitigation measures, including reduced transmit power, antenna pointing azimuth or even lack of use of small portions of the acquired spectrum, by the new purchaser, in order to prevent interference to incumbents.

Not shown on the proposed PTC 220 MHz spectrum plan is 100 KHz of additional spectrum that was not included in the FCC auction, but instead has been set aside for "Non-Nationwide Public Safety Radio Service use" only. While it might seem that the SCRRA's mission meet the qualifications for said use, individuals at FCC have indicated otherwise. As a result, an additional 100 KHz of 220 MHz spectrum may be available, at no cost to the SCRRA. The SCRRA would be required to submit an application to the FCC for said spectrum.

FIGURE 1.2a EA BOUNDARIES FOR THE CONTINENTAL US
Economic Areas (EAs)

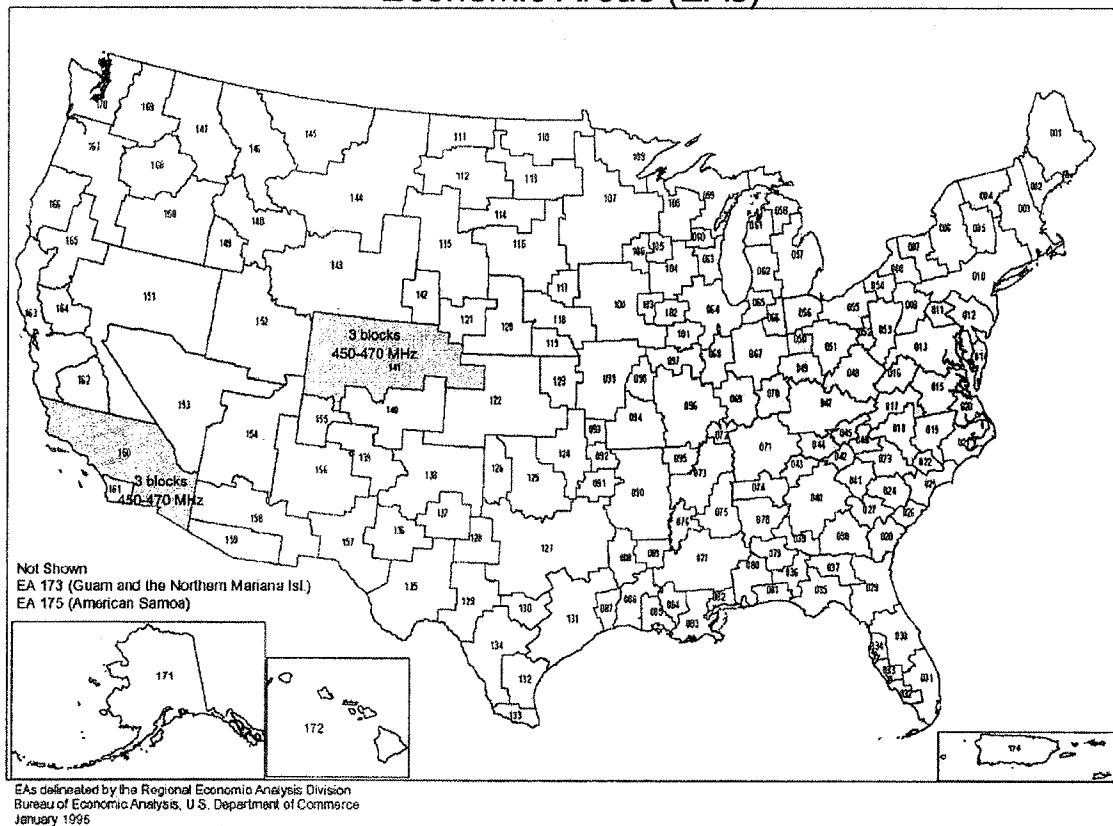
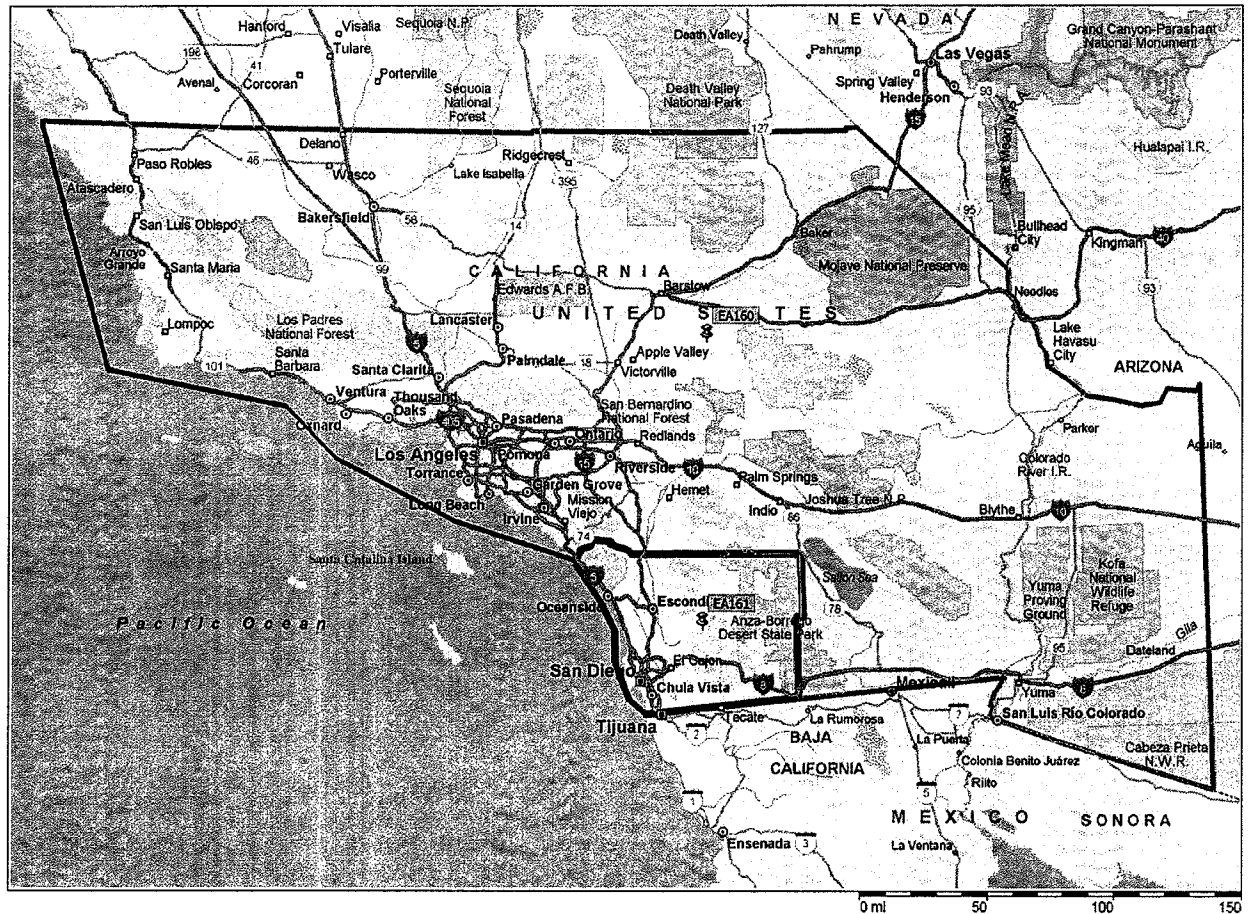


FIGURE 1.2b EA 160 and EA 161 BOUNDARIES FOR SOUTHERN CALIFORNIA



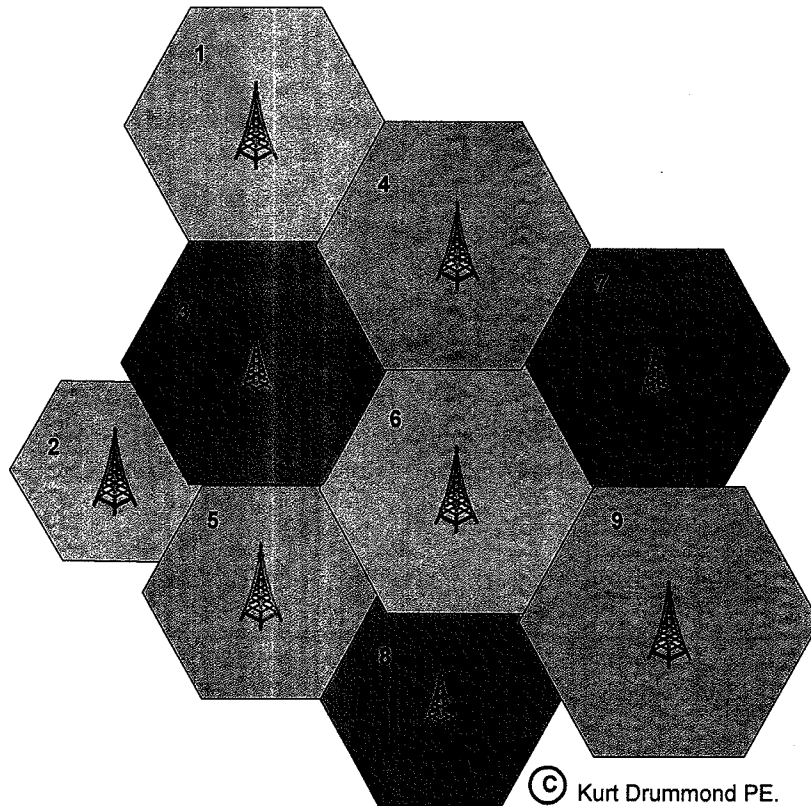
Copyright © 1985-2005 Microsoft Corp. and/or its suppliers. All rights reserved. <http://www.microsoft.com/streets/>
 © 2004 NAVTEQ. All rights reserved. This data includes information taken with permission from Canadian authorities © Her Majesty the Queen in Right of Canada. © Copyright 2004 by TeleAtlas North America, Inc. All rights reserved.

It is expected that the acquired spectrum shall be deployed in one of two network architectures for the PTC implementation as follows:

- 1- **An architecture based on the cell concept (see figure 1.3 below)** in which the range of each base station coverage is deliberately limited to a specified number of miles also known as a cell, in order to re-use the same frequencies in a nearby semi-adjacent cell. (The greater the deliberate limitation on the range of each base station coverage, the smaller the resulting cell, and the more cells that are created, hence the greater the ability to re-use the same frequencies more often, hence the greater the number of locomotives that can be controlled with a limited quantity of spectrum **simultaneously**.) - Analogous to cell phone coverage in a big city, by commercial carriers, for example the frequencies used in cell #1 in figure 1.3 below can be reused in cells #2 and #6, Likewise the frequencies used in cell #3 can be reused in cells # 7 and 8. Similarly cells 4, 5 and 9 use the same frequencies. This illustration represents only the simplest of cellular architectures for illustration purposes only. It is expected that, should the cellular architecture be the

one selected for use, the actual SCRRA cellular architecture will be significantly more complex. On the other hand, where only a single rail line exists with no neighboring tracks, a simpler linear arrangement of frequencies may be feasible.

It is important to note that, unlike cellular phones, PTC requires highly reliable continuous communications coverage. And the radios typically require a C/I of at least 20 dB. So, an N=7 frequency re-use plan, which might be adequate for cellular phone service, may not suffice for PTC.



One big advantage of the cell concept is the frequency re-use enables a large number of simultaneous talk-paths. One big disadvantage is the massive arbitration overhead in “handing” off to different cells that can increase the number of “dropped” links.

- 2- ***An architecture based on the Multi-cast concept***, which is somewhat analogous to having simultaneous ATCS frequency pairs providing wide area coverage to “moving” control points. In this architecture, mixtures of multicast and simulcast techniques are used so that all frequencies are broadcast using high elevation Base Station sites to have coverage footprints that provide blanket coverage to the entire territory. Using this architecture, the total of all frequency pairs will be available to all users anywhere in the territory in any combination of serial and parallel links.

This means for example that if there is a heavy concentration of traffic in any one area, the entire PTC 220 MHz spectrum is available (on a first request first served or some other basis) to clear and control said traffic. The advantage to this approach is it better manages a region (like SCRRA territory) with pockets of very busy traffic and other areas of low to mild traffic). It is not the best approach where you expect the traffic to be fairly evenly distributed over a large region (so for example if every square mile of territory has an average of two trains- then it would require an average of two talk-paths).

One big advantage of the Multi-cast concept is its adaptability to handle un-even traffic distribution- because all the simultaneous talk paths possible are available anywhere in the coverage footprint. One big disadvantage is it cannot employ frequency re-use therefore does not get the multiplicative effect on the number of simultaneous talk-paths. Given the lack of clear consensus architecture at this late stage, it is prudent to adopt the most conservative frequency acquisition strategy to mitigate potential future risks to SCRRA operations caused by insufficient 220 MHz spectrum. **Enough is known of the architecture, however, to say with near certainty that the multicast concept will not accommodate all of Metrolink's train traffic, even if all 1 MHz is obtained.**

In the event that the SCRRA purchases more 220 MHz spectrum than is required for PTC, then, subject to licensing constraints, the excess spectrum may either be re-sold, swapped or in whole or part, used for emergency voice radio communications, similar to that currently done on existing 160 MHz licenses. Unlike the 160 MHz licenses however, such **voice** radio communication in the 220 MHz band **would not be interoperable with other tenant railroads** (because they would not be likely to have 220 MHz voice radio equipment pre-installed on their locomotives).

1 MHz not
needed

Appendix 2. Business Issues involved in acquiring and then using the 220 MHz spectrum

- Potential loss of this opportunity to another buyer. SEPRAs already has an agreement with the seller to run tests on the spectrum (which are probably now complete). This shows serious competition for the spectrum. Delaying action or publically divulging Metrolink's interest in this spectrum offering could seriously jeopardize ability to obtain it.
- Excess spectrum. While a 1 MHz wide block of spectrum is being offered, Metrolink will likely require less than that for PTC. It will take time, however, to compute the exact amount of spectrum needed during which the spectrum could be purchased by another buyer. Furthermore, the amount of spectrum required for Metrolink PTC won't be known precisely until the design and testing of the interoperable (ITC) version of Vital/Electronic Train Management System (V/ETMS) is done.

The railroad interoperability specifications for the V/ETMS system are still under development. Once they are completed (the first draft is estimated to be released at the end of 2009), the supplier must then design and implement the system. Then it must be tested on a railroad under all possible operating scenarios, including the four seasons, different multipath scenarios, and the effects of sunspots which will become significant again in 2011. Until all of those tests are done, it will not be known for sure how much spectrum will be required for the initial deployment of PTC.

These considerations plus the likelihood of future expansions of PTC functionality argue in favor of acquiring excess spectrum at 220 MHz for Metrolink's PTC system.

The seller has offered language in the agreement that allows a couple months of extra time (after FCC approval of the Metrolink spectrum license) for Metrolink to decide if they wish to purchase the entire 1 MHz of spectrum or a lesser amount. Note that the price increases from \$0.35 per MHz-pop to \$0.45 per MHz-pop if anything less than the full 1 MHz block is purchased. Down payment must be for the maximum amount of spectrum that Metrolink may want and a pro-rated portion will thus be forfeited if Metrolink purchases less than the full 1 MHz. Seller has recently offered the possibility of some improvement on these terms.


- The FCC requirement to demonstrate significant use of the spectrum by 2017. Operation of a PTC system before then should satisfy this requirement. However, the question exists as to how much of the spectrum block must be shown to be in use by then. No clear guidelines exist. However, a precedent has been set by FCC in the case of PTC-

Price
increase
for less
spectrum
was the
issue
with
SCRRA.
It wanted
more for
cheaper
price.

220, who was recently granted a waiver (extension) on this requirement.
The leasing of excess spectrum to users such as the 2-way radio company may help in this regard.

Appendix 3. Business Plan or Strategy for obtaining the necessary PTC spectrum

SCRRRA fully aware of
"Havens'" challenge
prior entering agreement
with MCLM.




- Steps:
 1. Have an FCC-knowledgeable attorney review the spectrum regulations, issues (Haven's challenge, maritime primary use requirement, etc.), seller's draft contract, seller's price (as compared with historical sales) and alternatives. [Metrolink]
 2. Agree upon the required geographical coverage. [Metrolink]
 3. Analyze potential interference at boundaries to determine if additional area is required as a "guard" region. [SYSTRA/TTCI]
 4. Determine if seller's estimate of current population in the coverage area is appropriate (for pricing purposes). [Metrolink/FCC attorney]
 5. Agree within Metrolink to execute agreement and make down payment for full 1 MHz block (vs. subset thereof). [Metrolink]
 6. Execute agreement, making down payment. [Metrolink and Spectrum Bridge]
 7. Apply for FCC license in Metrolink's name. [Spectrum Bridge]
 8. Complete detailed capacity requirements analysis. [SYSTRA/TTCI]
 9. Decide if will acquire full 1 MHz. [Metrolink, considering TTCI's capacity requirement analysis and Metrolink's other potential uses of spectrum].
 10. License granted (if denied, down payment is refunded). [FCC]
 11. Upon FCC approval and completion of capacity analysis (whichever is later), execute agreement with payment in full. [Metrolink]
- Schedule:
 - Steps 1-6 need to occur ASAP. Every passing day gives an opportunity for others (e.g., SEPRA) to lock up the spectrum.
 - Step 7 is completed within 15 days by seller.
 - Step 8 must be complete within 6 months of executing the agreement (step 6).
 - Step 9 must be done before step 11.
 - Step 10, FCC license is usually granted within 4 months of executing the agreement (step 6). The Warren Havens' challenge, however, may add time to this process.
 - Step 11 must be done within 6 months of step 6.
 - Demonstration of substantial use of the spectrum must occur by 2017.
 - License renewal with FCC must occur in 2017. A nominal renewal fee is required then.
- Costs:
 - Down payment is estimated to be \$717,800.
 - Total payment (including down payment) is estimated to be \$7,178,000.

- Seller pays FCC filing fees.
- Broker commission is included in above price.
- Cost of FCC-knowledgeable attorney.
- Ongoing support from SYSTRA/TTCI and xorail team.

Appendix 4. Draft MC/LM Contract

Aware of
challenges to
license.



The attached draft spectrum will need modifications and caveats to address: Maritime use, reduced down payment, potential interference with channel 13, Warren Havens' challenge to MC/LM's license (wording added to the contract making it clear that Metrolink's deposit is to be refunded in full if MCLM's license is revoked), Build-out time.

See attached draft contract.

Trace A

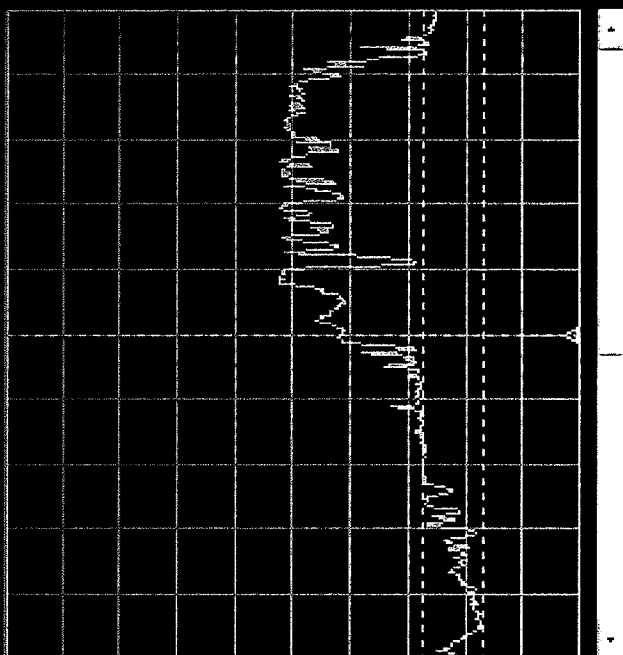
Log 10.00 dB/div

Ref -50.00 dBm

Trace B

Log 10.00 dB/div

Ref -50.00 dBm



Center

Y2 217.80 MHz

Span

Y1 200.00 kHz

RBW 3.0 kHz

VBW 3.0 kHz

Sweep Time

67.00 msec

AT 0 dB

Peak

X1

X2

Marker
source

Trace A

▼

Y1 -77.426160338 dBm

X1 217.800000000 MHz

Trace A

▼

Y2 -66.877637131 dBm

X2 217.899248120 MHz

Δ 10.548523207 dB

Δ 99.248120301 kHz

**RE: PROPOSED LANGUAGE FOR SCRRRA MCLM CONTRACT DOCUMENT
REQUIRED DISCLOSURES BY MCLM
Prepared by XORAIL
12/10/09**

REQUIRED FOR ALL LESSEES IN THE AMTS A BAND

[illegible]

REQUIRED FOR ALL INCUMBENTS IN THE AMTS A BAND

[illegible]

Chan Freq	SAN
41 - 217.5125	
42 - 217.5250	
43 - 217.5375	
44 - 217.5500	MPT 18
45 - 217.5625	
46 - 217.5750	
47 * - 217.5875	MPT 17
48 - 217.6000	
49 - 217.6125	
50 - 217.6250	
51 * - 217.6375	LTR 15
52 * - 217.6500	
53 - 217.6625	
54 - 217.6750	
55 * - 217.6875	LTR 12
56t - 217.7000	
57 - 217.7125	MPT 16
58 - 217.7250	
59 - 217.7375	
60 - 217.7500	MPT 15
61 - 217.7625	MPT 14
62 - 217.7750	
63 - 217.7875	
64 - 217.8000	MPT 13
65 - 217.8125	
66 - 217.8250	
67 * - 217.8375	
68 - 217.8500	MPT 12
69 - 217.8625	
70 - 217.8750	
71 * - 217.8875	LTR 20
72 * - 217.9000	
73 - 217.9125	
74 - 217.9250	MPT 01
75 - 217.9375	LTR 17
76 - 217.9500	
77 - 217.9625	
78 - 217.9750	
79 - 217.9875	



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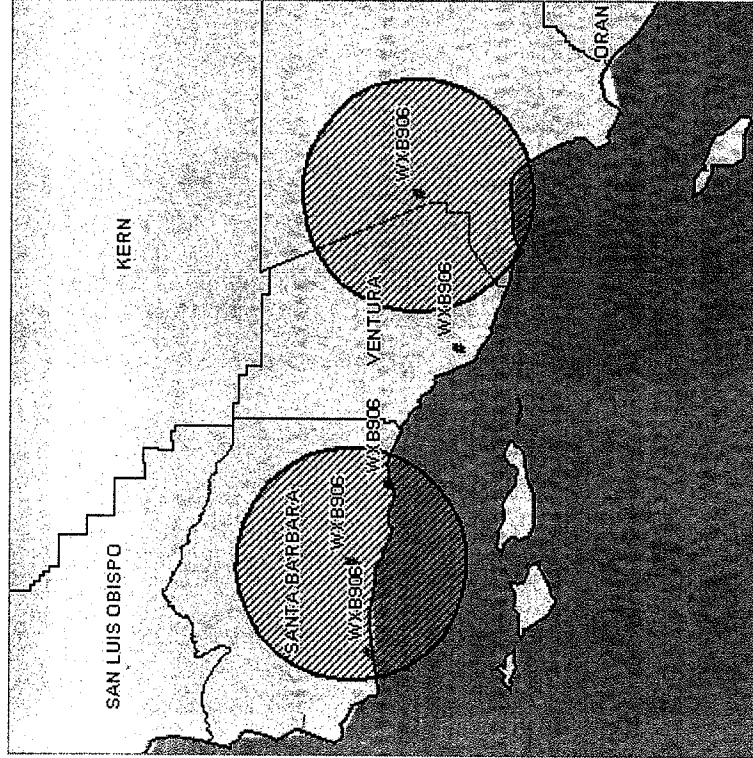
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Map Options

Layer Name	Legend	Visible	Labeled
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Counties		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
BTA		<input type="checkbox"/>	<input type="checkbox"/>
MTA		<input type="checkbox"/>	<input type="checkbox"/>
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REA		<input type="checkbox"/>	<input type="checkbox"/>
VPC		<input type="checkbox"/>	<input type="checkbox"/>
RPC		<input type="checkbox"/>	<input type="checkbox"/>
USA		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
World1		<input checked="" type="checkbox"/>	<input type="checkbox"/>

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☐ Drill Down
☐ ReCenter

Map Width (meters):

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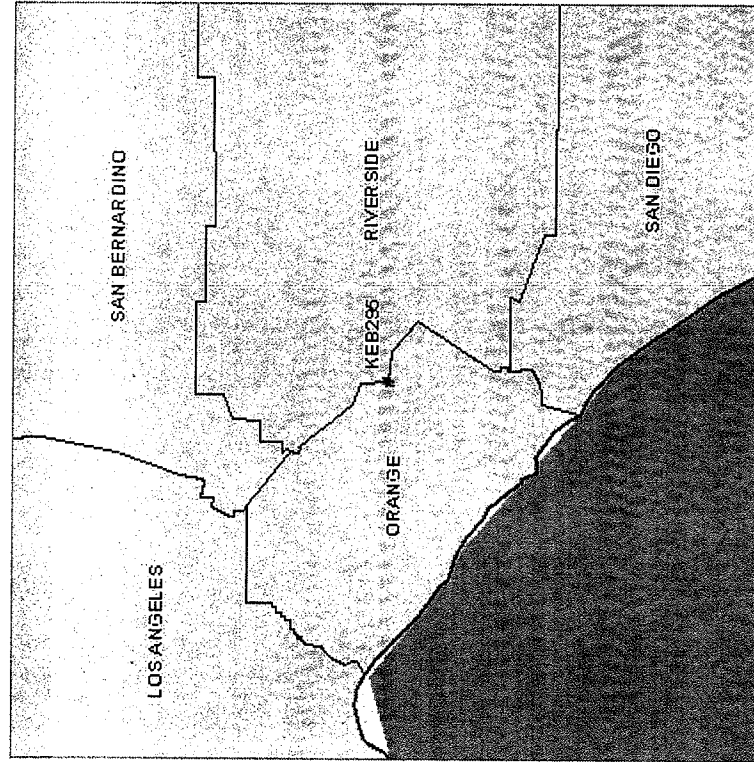
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Map Options

Layer Name	Legend	Visible	Labelled
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EAG		<input type="checkbox"/>	<input type="checkbox"/>
REA		<input type="checkbox"/>	<input type="checkbox"/>
VPC		<input type="checkbox"/>	<input type="checkbox"/>
RPC		<input type="checkbox"/>	<input type="checkbox"/>
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World1		<input checked="" type="checkbox"/>	<input type="checkbox"/>

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ULS Application

0003796275 - Avista Corporation

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MAIN	ADMIN	TRANS LOG	ASSIGNMENTS	LICENSES	DESIGNATED ENTITY	REVENUE
File Number	0003796275		Application Status	M - Consummated		
General Information						
Application Purpose	AA - Assignment of Authorization					
Receipt Date	04/08/2009					
Entered Date	04/08/2009		Action Date	08/06/2009		
Waiver	No		Number of Rules			
Attachments	Yes					
Application Fee Exempt	No		Waiver/Deferral Fee	No		
Assignor Information						
FRN	0009561002 (View Ownership Filing)		Type	Limited Liability Company		
Name	Verde Systems LLC ATTN Warren Havens 2649 Benvenue Ave., #2-6 Berkeley, CA 94704			P:(510)841-2220 F:(510)841-2226 E:warren.havens@sbcglobal.net		
Race			Gender			
Ethnicity						
Assignor Contact Information						
Name	Verde Systems LLC ATTN Warren Havens 2649 Benvenue Ave., #2-6 Berkeley, CA 94704			P:(510)841-2220 F:(510)841-2226 E:warren.havens@sbcglobal.net		

Assignee Information			
FRN	0001583293 (View Ownership)	Type	Corporation
Name	Avista Corporation ATTN Brent Schlangen PO Box 3727 1411 East Mission Spokane, WA 99220		P:(509)495-4807 E:bschlangen@avistacorp.com
Real Party In Interest	Avista Corporation	FRN of Real Party in Interest	0001583293
Race		Gender	
Ethnicity			
Assignee Contact Information			
Name	Keller and Heckman LLP ATTN Greg Kunkle 1001 G Street NW, Suite 500 West Washington, DC 20001		P:(202)434-4178 E:kunkle@khlaw.com
Assignee Qualifications and Ownership Information			
Alien Ownership The Applicant answered "No" to each of the Alien Ownership questions.			
Basic Qualifications The Applicant answered "No" to each of the Basic Qualification questions.			

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About ULS	Privacy Statement - About ULS - ULS Home		
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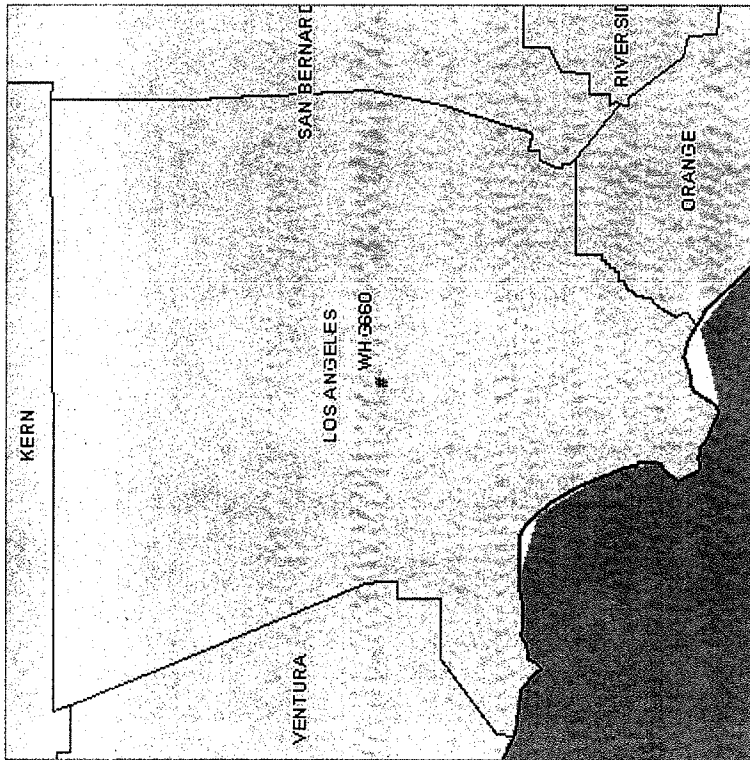
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m

Map Options		
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VPC		<input type="checkbox"/>
RPC		<input type="checkbox"/>
USA		<input checked="" type="checkbox"/>
World1		<input checked="" type="checkbox"/>

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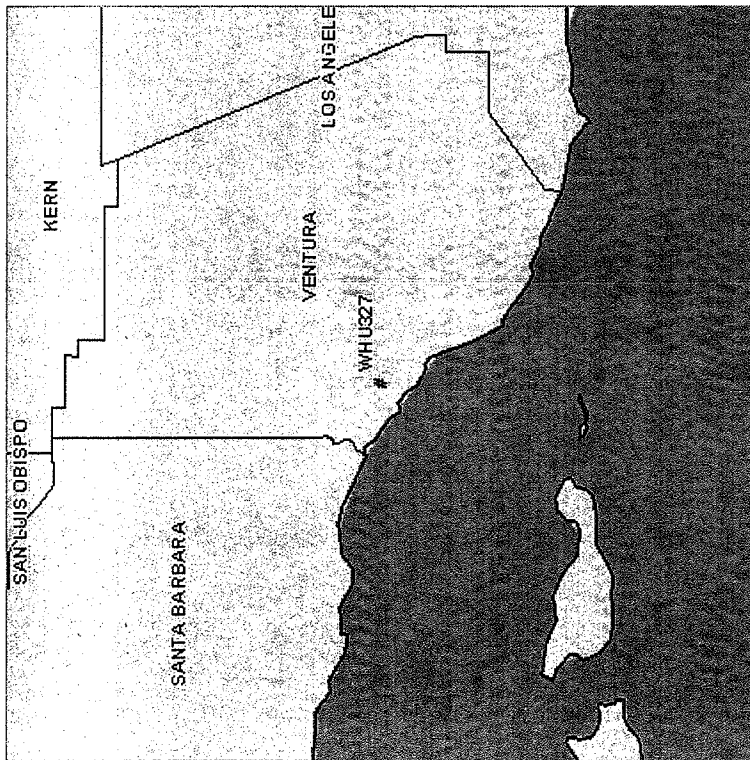
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Map Options		
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World1	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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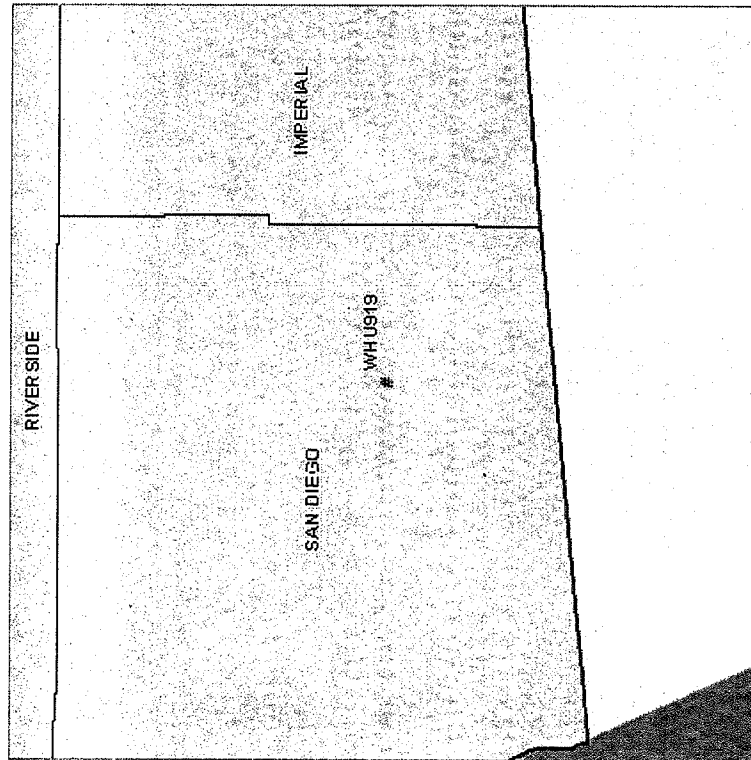
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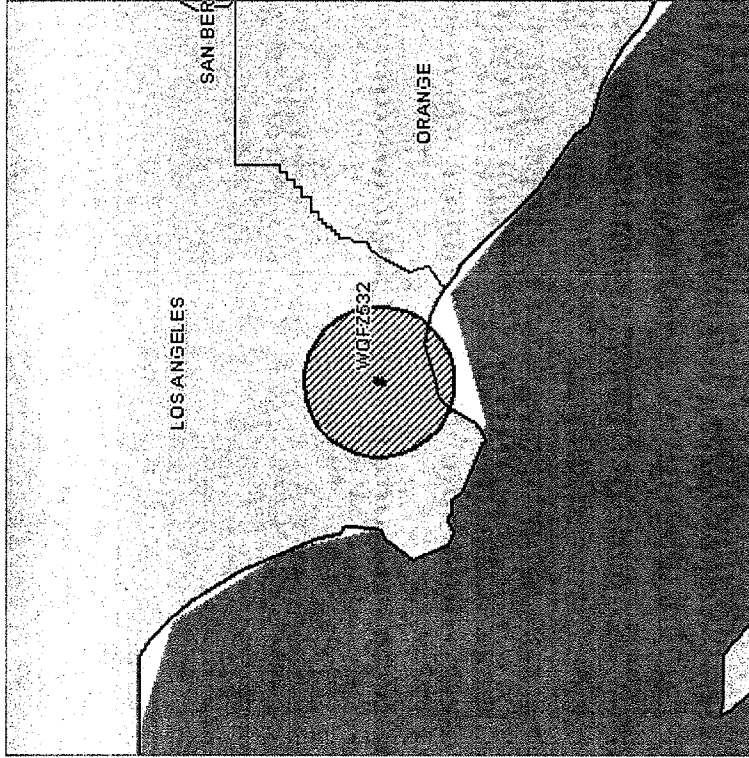
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World1		<input checked="" type="checkbox"/>	<input type="checkbox"/>

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WQCL270	California Water Service Company	11098308 IG	Active	3/30/2015	Int of W. Lincoln & N. Verde Systems LLC
WQDH945	South San Francisco, City of	7530983 IG	Active	9/1/2015	701 Forbes Boulevard
WQDL925	County of Mariposa Department of	13923552 IG	Active	9/27/2015	east side of Hennessy f near 7488 Hennessy Ci 0.45 km NNE of Yoser 0.40 km NNW of Yose 1.26 km WNW of Yose 75 m north of Hennes 10/3/2015 1303 Aspen Street, Se 100 Golden State Blvc 9213 Golden State Blk 1819 West Front Stre 1500 18th Street, King 16306 McCall Avenue 10/4/2015 410 North 10th Street 301 West Peach Stree 201 Jonna Street, Fow 420 East South Street 4330 Jefferson Avenu SE corner of Tempera 10/4/2015 1200 Mehlert Street, 641 Kern Street, Kings 2300 Skansen Street, 2536 Rose Avenue, Fc 2314 Goldenridge Stri 3005 McCall Avenue, 10/4/2015 1303 McCall Avenue, 1943 Thompson Aven 3202 Love Street, Selr 10/14/2015 220 West Minnesota , 1.6 km N of California 100 m north of Califoi
WQDM705	Selma, Kingsburg, Fowler, Sanitatio	13931449 IG	Active		
WQDM880	Selma, Kingsburg, Fowler, Sanitatio	13931449 IG	Active		
WQDM886	Selma, Kingsburg, Fowler, Sanitatio	13931449 IG	Active		
WQDM891	Selma, Kingsburg, Fowler, Sanitatio	13931449 IG	Active		
WQDR702	McCloud CSD	8793812 IG	Active		

WQDX478	Yuba County Water District	9509951 IG	Active	11/22/2015	Squaw Valley Road, O. 118 Buckeye Drive, Fc 180m North of 18140 275m W of NY Flat Rd Near 16500 Eden Lane N of 9093 Nero Rd., O
WQFZ532	UNION PACIFIC RAILROAD COMPAN	1539048 IG	Active	11/16/2016	2401 EAST SEPULVED. 8.0 km radius around
WQJW656	Skybridge Spectrum Foundation	16374563 PC	Active	4/26/2015	Not Given
WQKP318	Avista Corporation	1588293 PC	Active	4/26/2015	Not Given
WXB906	UNION PACIFIC RAILROAD COMPAN	1539048 IG	Active	9/2/2012	M/W BLDG SANTA YN

Lat & Lon	Tx Power	Freq 217	Freq 219
38-24-31.7 N, 122-01-11.7 W	50	000217.01250000-000217.48750000	
33-42-39.1 N, 117-31-11.7 W	50	000217.01250000-000217.48750001	
37-51-11.7 N, 122-11-11.7 W	50	000217.01250000-000217.48750002	
34-16-09.0 N, 118-11-11.7 W	50	000217.01250000-000217.48750003	
34-20-55.0 N, 119-21-11.7 W	50	000217.01250000-000217.48750004	
32-52-39.0 N, 116-21-11.7 W	50	000217.01250000-000217.48750005	
37-10-01.8 N, 121-51-11.7 W	50	000217.01250000-000217.48750006	
40-43-36.5 N, 123-51-11.7 W	50	000217.01250000-000217.48750007	
37-32-33.8 N, 122-21-11.7 W	50	000217.01250000-000217.48750008	
34-31-36.0 N, 119-51-11.7 W	50	000217.01250000-000217.48750009	
34-13-33.0 N, 118-01-11.7 W	50	000217.01250000-000217.48750010	
37-45-04.8 N, 119-01-11.7 W	4.5	217.1	
39-02-06.6 N, 120-41-11.7 W	12	217.375	
39-07-30.6 N, 120-41-11.7 W	9	217.375	
39-07-47.6 N, 120-41-11.7 W	12	217.375	
38-14-39.0 N, 122-51-11.7 W	8	217.3	
	14	217.3	
40-52-55.2 N, 123-51-11.7 W	7	217.025	
	4	217.025	
37-38-34.2 N, 122-21-11.7 W	14	217.275	
37-38-28.8 N, 122-21-11.7 W	14	217.275	
37-38-59.4 N, 122-21-11.7 W	14	217.275	
37-38-29.4 N, 122-21-11.7 W	14	217.275	
37-38-57.6 N, 122-21-11.7 W	14	217.275	
37-39-01.0 N, 122-21-11.7 W	14	217.275	
41-57-50.3 N, 121-51-11.7 W	14	217.45	
41-57-54.6 N, 121-51-11.7 W	2	217.45	
41-58-22.9 N, 121-51-11.7 W	2	217.45	
41-57-56.5 N, 121-51-11.7 W	2	217.45	
41-57-40.9 N, 121-51-11.7 W	2	217.45	
38-53-17.0 N, 121-01-11.7 W	8	217.475	
38-53-23.0 N, 121-01-11.7 W	2	217.475	
38-53-21.0 N, 121-01-11.7 W	2	217.475	
34-01-26.5 N, 118-01-11.7 W	14	217.025	

34-01-27.5 N, 118-0'	14	217.025
AMT006 - Southern Not Given	000217 00000 000219 000000000 000219 500000000	
AMT006 - Southern Not Given	000217 00000 000219 000000000 000219 500000001	
AMT006 - Southern Not Given	000217 00000 000219 000000000 000219 500000002	
37-39-31.1 N, 122-2'	15	217.275
37-38-56.0 N, 119-4'	7	217.4
37-38-41.0 N, 119-4'	1.9	217.4
37-39-19.0 N, 119-4'	1.9	217.4
37-39-19.0 N, 119-4'	1.9	217.4
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39-30-55.0 N, 121-10	7	217.075
39-29-12.0 N, 121-13	26	217.075
39-31-13.0 N, 121-10	14	217.075
39-26-36.0 N, 121-13	14	217.075
39-28-28.0 N, 121-10	14	217.075
33-48-22.1 N, 118-13	2, 3	217.05, 217.0875, 217.0125, 217.1625, 217.2, 217.2375, 217.275
a fixed location 1	2	217.05, 217.0875, 217.0125, 217.1625, 217.2, 217.2375, 217.275
AVT006 - Southern Not Given	000217.00000	000219.00000000-000219.50000000
AVT006 - Southern Not Given	000217.00000	000219.00000000-000219.50000000
34-31-37.0 N, 119-58	7	217.1375

**RE: PROPOSED LANGUAGE FOR SCRRRA MCLM CONTRACT DOCUMENT
REQUIRED DISCLOSURES BY MCLM
Prepared by XORAIL
12/10/09**

REQUIRED FOR ALL LESSEES IN THE AMTS A BAND

[illegible]

Subject: FW: MCLM's current leasing of their spectrum in LA

Attachments: MC_LM Lease Spectrum Mgr.pdf



MC_LM Lease
Spectrum Mgr.pdf (..

-----Original Message-----

From: alan_polivka@aar.com [mailto:alan_polivka@aar.com]
Sent: Monday, November 02, 2009 5:05 PM
To: k.drummond@xorail.com; J.Zerzan@xorail.com; Maxey, Darrell; Guerrero, Dan;
hschweitzer@systausa.com
Subject: MCLM's current leasing of their spectrum in LA

Folks,

Attached is information that MCLM provided about the "incumbant" who's currently leasing their 220 MHz spectrum from them in the Los Angeles area.

I believe John Reardon (MCLM) told me that the lease must be renewed annually, although I see a December 2011 expiration date on the attachment, so I don't know if that's an inconsistency, or if there's some other explanation. In any event, I will forward this to the attorneys as well so that they make sure it's adequately addressed in the LOI and APA.

Alan L. Polivka, Assistant Vice President
Communications, Train Control & IT
Transportation Technology Center, Inc.
55500 DOT Road, PO Box 11130, Pueblo, CO, 81001

alan_polivka@ttci.aar.com
719-584-0657 Phone 719-250-6126 Mobile
7192506126@vtext.com SMS Text to Mobile Phone

(See attached file: MC_LM Lease Spectrum Mgr.pdf)

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Federal Communications Commission
Wireless Telecommunications Bureau

Spectrum Leasing Arrangement

ATTN: SANDRA M. DEPRIEST
MARITIME COMMUNICATIONS/LAND MOBILE, LLC
206 NORTH 8TH STREET
COLUMBUS, MS 39701

Date: 06/06/2009
Reference Number: 4870330

This approval allows the Lessee to lease spectrum from the Licensee pursuant to the provisions and requirements of Subpart X of Part 1 of the Commission's Rules, 47 C.F.R. Part 1, and as described in the associated spectrum leasing application or notification.

Type of Lease Arrangement	Lease Term	Lease Identifier
Spectrum Manager Lease	Long Term	L000005430

Lease Grant/Accepted Date	Lease Commencement Date	Lease Expiration Date
06/05/2009	04/27/2009	12/31/2011

Call Sign	Radio Service
WQGF318	PC - Public Coast Stations, Auctioned

Lessee Information

0005808035
SPECTRUM TRACKING SYSTEMS, INC.
Attn: JON J. GERGEN
2545 TARPLEY ROAD
CARROLLTON, TX 75006

Licensee Information

0005808035
MARITIME COMMUNICATIONS/LAND MOBILE, LLC
Attn: SANDRA M. DEPRIEST
206 NORTH 8TH STREET
COLUMBUS, MS 39701

Geographically-Licensed Services		
Market Number	Market Name	Channel Block
AMT006	Southern Pacific	A

Condition:

This lease may not authorize operation throughout the entire geographic area or spectrum identified on the hardcopy version. To view the specific geographic area and spectrum associated with this leasing agreement, refer to the Spectrum and Market Area information under the Market Tab of the license record in the Universal Licensing System (ULS). To view the license record, go to the ULS homepage at <http://wireless.fcc.gov/uls/index.htm?job=home> and select "License Search". Follow the instructions on how to search for license information.

Conditions:

Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.